

ABSTRACT OF THE DISCLOSURE

A method of forming a silicon oxide layer in a semiconductor manufacturing process includes forming a planar spin on glass (SOG) layer by coating an SOG composition onto a semiconductor substrate having a stepped portion formed thereon, pre-baking the substrate at a temperature of from about 100 to about 500°C for about 1 to about 10 minutes, maintaining a loading temperature of a furnace into which the substrate will be loaded at about 500°C or less, loading the substrate into the furnace, and main-baking the substrate at a temperature of from about 500 to about 1200°C for about 10 to about 120 minutes to form a silicon oxide layer on the substrate. The SOG layer is transformed into the silicon oxide layer through an optimized process condition. Thus, the silicon oxide layer may have minimal defects and a good layer property.